

## [Recovery Plan for \*Cordia bellonis\*](#)

**Original Approved:** October 1, 1999

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### **DRAFT AMENDMENT 1**

We have identified best available information that indicates the need to amend recovery criteria for *Cordia (Varronia) bellonis* (no common name) since the recovery plan was completed. In this proposed modification, we synthesize the current information available, identify amended recovery criteria, and present the rationale supporting the proposed recovery plan modification. The proposed modification will be shown as an addendum that supplements the recovery plan (USFWS 1999), superseding only Part II A page 7 of the recovery plan. Recovery plans are a non-regulatory document that provides guidance on how best to help recover the species.

**For  
U.S. Fish and Wildlife Service  
Caribbean Ecological Service Field Office, Region 4  
Boquerón, Puerto Rico**

**September 2018**

**[Insert Signature Lines (for final modification)]**

### **METHODOLOGY USED TO COMPLETE THE RECOVERY PLAN AMENDMENT**

The proposed amendments to the recovery criteria are based on information from our files and contained in the 2017 5-year review. This information was prepared by U.S. Fish and Wildlife Service (Service) biologists and managers in the Caribbean Ecological Services Field Office (CESFO) in order to develop the delisting criteria for *Cordia bellonis*.

### **ADEQUACY OF RECOVERY CRITERIA**

Section 4(f)(1)(B)(ii) of the Endangered Species Act (Act) requires that each recovery plan shall incorporate, to the maximum extent practicable, “objective, measurable criteria which, when met, would result in a determination...that the species be removed from the list.” Legal challenges to recovery plans (see *Fund for Animals v. Babbitt*, 903 F. Supp. 96 (D.D.C. 1995)) and a Government Accountability Audit (GAO 2006) also have affirmed the need to frame recovery criteria in terms of threats assessed under the five listing factors.

### **Recovery Criteria**

See previous version of criteria in [Recovery Plan for \*Cordia bellonis\*](#) on page 7.

## Synthesis

At the time listing, *Cordia bellonis* was known from Maricao, Susúa, and Río Abajo Commonwealth forests (USFWS 1999). Sánchez-Cuervo (2006) updated population estimates in the Maricao, Susúa and Río Abajo Commonwealth forests and provided new relevant information about these three (3) populations. According to Sanchez-Cuervo (2006), the species may be extirpated from the Susúa Commonwealth Forest, and some historical locations in the Río Abajo and Maricao Commonwealth forests were not located during the research. However, Hamilton (2017), with an ongoing Cooperative Agreement between the Service, Puerto Rico Department of Natural and Environmental Resources (PRDNER), and the Royal Botanical Garden, reported at least 247 adult individuals of this species within the Maricao (207) and Río Abajo Commonwealth forests (40). Also, the Service and PRDNER located 115 new individuals of *Cordia bellonis* within the Maricao Commonwealth Forest (Ríos-Cruz, USFWS, 2017 unpublished data). In addition, the distribution of the species in Puerto Rico has expanded to privately-owned lands within the municipality of Maricao, and in the municipalities of Ciales and Utuado (Hamilton 2017). Additional surveys are planned along the northern karst and the Susúa Commonwealth Forest.

Germination experiments were conducted for *Cordia bellonis* without success (Sánchez-Cuervo 2006). Failure was attributed to the possible inadequacy of substrate for planting, and low viability of seeds. Further germination trials by Service biologist O. Monsegur (2012) suggest it is very likely that the species shows a low seed viability, or may require seed scarification to germinate. The Service believes that propagation of the species from seed is not a constraint for future propagation efforts since *Cordia bellonis* has been propagated by University of Puerto Rico Mayaguez campus (UPRM), PRDNER and Service staff (USFWS 2017).

Destruction and modification of habitat (Factor A) continues to be a threat to the species, particularly on historical localities located along roads and trails (e.g., PR 120 in Maricao Commonwealth Forest) that are subject to road maintenance activities and exposed to the cutting of branches (Sanchez-Cuervo 2006). However, the species has been detected on multiple areas along PR-120 and within remote and inaccessible remnants of pristine habitat (not associated to disturbed sites or roads) in the Maricao (i.e., Maricao and Bonelli Rivers Watersheds) and Río Abajo (i.e., Las Perdices and Los Puercos Trail) Commonwealth forests (Hamilton 2017).

Other natural or manmade factors affecting its continued existence (Factor E) include human-induced fires, river flooding and landslides (USFWS 2017). After Hurricane Maria, Service employees documented the loss of known individuals of *Cordia bellonis* due to river flooding and landslides along the Río Maricao and Indiera sites. Thus, individuals of *Cordia bellonis* growing in steep slopes and low profile soils may be affected by landslides during heavy rain events.

## AMENDED RECOVERY CRITERIA

Recovery criteria serve as objective, measurable guidelines to assist in determining when an endangered species has recovered to the point that it may be downlisted to threatened, or that the protections afforded by the Act are no longer necessary and the *Cordia bellonis* may be delisted. Delisting is the removal of a species from the Federal Lists of Endangered and Threatened Wildlife and Plants. Downlisting is the reclassification of a species from an endangered species to a threatened species. The term “endangered species” means any species (species, sub-species, or DPS) which is in danger of extinction throughout all or a significant portion of its range. The term “threatened species” means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Revisions to the Lists, including delisting or downlisting a species, must reflect determinations made in accordance with sections 4(a)(1) and 4(b) of the Act. Section 4(a)(1) requires that the Secretary determine whether a species is an endangered species or threatened species (or not) because of threats to the species. Section 4(b) of the Act requires that the determination be made “solely on the basis of the best scientific and commercial data available.” Thus, while recovery plans provide important guidance to the Service, States, and other partners on methods of minimizing threats to listed species and measurable objectives against which to measure progress towards recovery, they are guidance and not regulatory documents.

Recovery criteria should help indicate when we would anticipate that an analysis of the species’ status under section 4(a)(1) would result in a determination that the species is no longer an endangered species or threatened species. A decision to revise the status of or remove a species from the Federal Lists of Endangered and Threatened Wildlife and Plants, however, is ultimately based on an analysis of the best scientific and commercial data then available, regardless of whether that information differs from the recovery plan, which triggers rulemaking. When changing the status of a species, we first propose the action in the *Federal Register* to seek public comment and peer review, followed by a final decision announced in the *Federal Register*.

We provide new delisting criteria for *Cordia bellonis*, which will supersede those included in its Recovery Plan. The recovery criteria presented below represent our best assessment of the conditions that would most likely result in a determination that delisting of *Cordia bellonis* is warranted as the outcome of a formal five-factor analysis in a subsequent regulatory rulemaking. Achieving the prescribed recovery criteria is an indication that the species is no longer threatened or endangered, but this must be confirmed by a thorough analysis of the five factors.

### **Amended Delisting Recovery Criteria**

The amended delisting criteria for *Cordia bellonis*:

- 1) Existing three (3) main populations at Rio Abajo, Maricao and Susúa Commonwealth forests show a stable or increasing trend, evidenced by natural recruitment and multiple age classes (addresses Factor A and E).
- 2) Existing three (3) populations on privately-owned lands in Maricao, Ciales and Utuado are protected via a conservation mechanisms, and show a stable or increasing trend, evidenced by natural recruitment and multiple age classes (addresses Factor A and E).

- 3) Threat reduction and management activities have been implemented to a degree the species is viable (addresses Factor E).

### **Rationale for Amended Recovery Criteria**

The proposed recovery criteria reflect the best available and most up-to date information on the biology, distribution, habitat, and current threats of *Cordia bellonis*. At present, the species is known from three main populations within the Maricao, Susúa, and Rio Abajo Commonwealth forests, and additional individuals or populations in privately-owned lands in Maricao, Ciales and Utuado. The species is currently threatened by habitat destruction and modification (Factor A), particularly along roads and trails of existing forests, and natural or manmade factors such as human-induced fires, river flooding, and landslides (Factor E).

The rationale for the recovery criteria is to minimize or eliminate the threats to the currently known populations at Maricao and Rio Abajo Commonwealth forests, and surrounding private lands where the species has been found (e.g. Indiera, Caguana Site, Rio Encantado) to the degree that the species is viable or self-sustaining. Based on our assessment of the current species data, we consider the population of the Maricao Commonwealth Forest as the best example of a self-sustainable population, evidenced by the population structure and the quality of the habitat. Conservation and management mechanisms include conservation easements, land-owners agreements, habitat enhancement projects, and control of invasive plants to prevent human-induced fires. The populations at Susúa Commonwealth Forest, Caguana, and Rio Encantado should be enhanced through propagation and planting efforts to ensure self-sustainability. Thus, a propagation protocol and program considering the species population genetics may be developed in the near future. Since the species is dioecious, it is important to manage the populations to have adequate frequency of male and female plants to secure cross pollination.

### **LITERATURE CITED**

Breckon, G. J. and D.A. Kolterman. 1993. Final report under Cooperative Agreement No. 1416-0004-92-970 between U.S. Department of the Interior, Fish and Wildlife Service and the University of Puerto Rico, Mayagüez Campus. Mayagüez, Puerto Rico. 14 pp.

Hamilton, M. A. (2017). Appendix 9: *Varronia bellonis* survey and collecting, July 2017. In M. A. Hamilton (Ed.), *Puerto Rican Bank (British Virgin Islands & Puerto Rico) June-July 2017 fieldwork report*. Overseas Fieldwork Committee registration number 559-14. (pp. 153–156). Richmond, Surrey, U.K.: Royal Botanic Gardens, Kew

Hamilton M.A. 2017. Population status and gene bank development for the endangered species *Varronia bellonis*; developing a framework for scientifically based recovery actions. PowerPoint presentation on project progress to CESFO.

Sánchez-Cuervo, A.M. 2006. Ecología Poblacional y Reproductiva de *Cordia bellonis* Urb. (Boraginaceae), una especie es peligro. M.S. thesis, University of Puerto Rico, Mayagüez Campus. 125 pp. 23.

U.S. Fish and Wildlife Service (USFWS). 1999. Recovery plan of *Cordia bellonis*. U.S. Department of the Interior, Fish and Wildlife Service, Southeast Region, Atlanta, GA. 18 pp.

U.S. Fish and Wildlife Service (USFWS). (2017). *Cordia bellonis* five-year review: summary and evaluation. US Fish & Wildlife Service Southeast Region Caribbean Ecological Services Field Office, Boquerón, Puerto Rico.